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REMARKS

The present response is to the Office Action mailed in the above-referenced case on October 3, 2003. Claims 1-16 are presented for examination. The Examiner has rejected claim 14 under 35 U.S.C. 112, second paragraph as being indefinite. Claims 1-3, 5, 6, 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubey (U.S. 5,724,565), hereinafter Dubey in view of Sharangpani (U.S. 5,699,537), hereinafter Sharangpani. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubey in view of Sharangpani, and further in view of Tremblay (U.S. 6,343,348), hereinafter Tremblay. Claims 9-11, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Dubey. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dubey as applied to claims 9-11, 13 and 15, and further in view of Tremblay.

Applicant has carefully studied the references cited and applied by the Examiner, and the Examiner's rejections and statements of the instant Office Action. In response applicant herein amends claim 14 to overcome the rejection due to informalities, and herein amends the independent claims to more particularly point out and distinctly claim the subject matter regarded as patentable, and to distinguish unarguably over the references as cited and applied by the Examiner. Applicant points out and argues the key limitations in the base claims as amended, that the Examiner appears to have misunderstood in his rejections and statements.

Applicant herein amends the language of independent claim 1 to specifically recite a single dispatch stage dedicated to the first cluster of streams for dispatching instructions of all of the streams in the first cluster to

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execution units; and a single dispatch stage dedicated to the second cluster of streams for dispatching instructions of all of the streams in the second cluster of streams to execution units. For convenience, applicant reproduces claim 1 as amended below.

Claim 1 as amended now recites:

1. *(Currently Amended) A pipelined multistreaming processor, comprising:*
 - an instruction source;*
 - a first cluster of a plurality of streams fetching instructions from the instruction source;*
 - a second cluster of a plurality of streams fetching instructions from the instruction source;*
 - dedicated instruction queues for individual streams in each cluster;*
 - a single dispatch stage dedicated to the first cluster of streams for dispatching instructions from all of the streams in the first cluster of streams to execution units; and*
 - a single dispatch stage dedicated to the second cluster of streams for dispatching instructions from all of the streams in the second cluster of streams to execution units;*
 - characterized in that the clusters operate independently, with the dedicated dispatch stage taking instructions only from the instruction queues in the individual clusters to which the dispatch stages are dedicated.*

Claim 9 is applicant's method claim for simplifying implementation and operation of the streams, in accordance with claim 1. Applicant has herein amended the language of claim 9 to specifically recite in step (b),

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dedicating a single dispatch stage to all of the streams of each cluster, for dispatching instructions to execution units.

Regarding claim 1, the Examiner has stated that Dubey taught applicant's invention substantially as claimed, including a first cluster of a plurality of streams fetching instructions from the instruction source, a second cluster of a plurality of streams fetching instructions from the instruction source, as well as applicant's claimed first dedicated dispatch stage in the first cluster, and second dedicated dispatch stage in the second cluster, for dispatching instructions to execution units. The Examiner has admitted that Dubey does not specifically detail that the instruction buffers that were individually dedicated to dispatchers comprised instruction queues, and has relied on the secondary reference of Sharangpani for teaching this deficiency.

In the Examiner's statements pertaining to Dubey the Examiner has stated that Dubey (Figs. 1A, 1B, col. 6, line 38 to col. 7, line 55 and col. 8, lines 16-60) teaches a first and second cluster of a plurality of streams, each fetching instructions from the instruction source. Applicant traverses the Examiner's statement, and respectfully points out to the Examiner that the above specific portions of Dubey do discuss a plurality of streams, but clearly do not teach or suggest that the streams are organized architecturally into a first cluster and a second cluster. In fact, nowhere in the specific portions, or anywhere else in the reference, for that matter, are any of the streams referred to as clusters at all. Dubey clearly does not teach, suggest or intimate dividing streams into defined separate clusters.

Referring now to applicant's specification, specifically Fig. 4, which illustrates a preferred embodiment of applicant's invention as embodied in applicant's claims, and the related description of the specification, applicant's invention teaches defining groups of streams into two separate and

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independently operable clusters, shown in Fig. 4 as Cluster A and Cluster B. Each separately defined cluster has a single dispatch stage dedicated to a plurality of instruction queues, the dispatch stage and plurality of instruction queues of one cluster of streams independently operable from those of the other cluster. Each dispatch stage is therefore dedicated to its own cluster of streams and instruction queues.

Dubey, in contrast, shows in Figs. 1A and 1B, that each dispatcher is dedicated to a particular port and instruction cache and a particular program counter, and therefore, does not teach separate, independent dispatch stages wherein each dispatch stage is dedicated to a particular cluster of streams. Dubey teaches several dispatch stages, one dispatch stage for each stream in a plurality of streams.

Applicant's invention, on the other hand, teaches one dispatch stage dedicated to all of the streams in the first cluster of streams, while being dedicated to none of the streams in the second cluster, which is necessary for each cluster to operate independently from the other, as is taught in applicant's invention. Further, applicant's invention teaches dedicated functional units (Fig. 4, execution units 69 of Cluster A, and execution units 61 of Cluster B). Dubey, however, shows in Figs. 1A and 1B, a single scheduler 150 which is taught to schedule to all functional units of block 180. The functional units of block 180 of Dubey are equivalent to execution units 69 and 61 of applicant's Fig. 4.

The Examiner has rejected applicant's independent method claim 9 as being anticipated by Dubey, stating that Dubey teaches all of the methods of applicant's claim. Applicant has herein amended the claim to specifically recite dedicating a single dispatch stage to all of the streams of each cluster, for dispatching instructions to execution units. Applicant respectfully points

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out to the Examiner, however, that Dubey does not teach a single dispatch stage dedicated to a cluster of streams, dispatching instructions from a plurality of streams in the cluster to which the dispatch stage is dedicated. Dubey teaches streams operating independently, but clearly does not teach dividing streams into separate clusters, which can operate independently from one another. There is clearly no teaching, suggestion or intimation whatsoever anywhere in Dubey for distinguishing groups of streams into clusters, which is required for practicing applicant's invention.


The Examiner has rejected claims 4 and 7 as being unpatentable over Dubey in view of Sharangpani, and further in view of Tremblay, and has rejected claims 12 and 14 as being unpatentable over Dubey as applied to claims 9-11, 13 and 15, and further in view of Tremblay. In view of applicant's above amendments to independent claims 1 and 9, and substantial arguments presented above by applicant that Dubey clearly does not teach all of the limitations of applicant's claims as amended, applicant strongly believes that claims 1 and 9 are therefore now clearly and unarguably patentable over Dubey, and Dubey therefore fails as a primary reference for anticipating the limitations of applicant's claims, or for reading on applicant's claims in combination with either the reference of Sharangpani or Tremblay, as either combination still fails to teach or suggest all of the limitations of applicant's base claims as amended. Depending 2-8 and 10-16 are then patentable on their own merits, or at least as depended from a patentable claim.

It is therefore respectfully requested that this application be reconsidered, the claims be allowed, and that this case be passed quickly to issue. If there are any time extensions needed beyond any extension specifically requested with this amendment, such extension of time is hereby requested. If there are any

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fees due beyond any fees paid with this amendment, authorization is given to deduct such fees from deposit account 50-0534.

Respectfully Submitted,
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